

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. The following listing provides the amended claims with deleted material crossed out and new material underlined to show the changes made.

1. (Currently Amended) A method of scaling a bit budget for encoding a digital video picture, said method comprising:

receiving a plurality of different ~~mapping~~ scaling relationships that specify a plurality of different ways for scaling the bit budget in relation to usage of a decoder buffer, the different ~~mapping~~ scaling relationships based on different relaxation levels for encoding the digital video picture, the different relaxation levels corresponding to different levels of concern regarding optimal use of the decoder buffer;

receiving a value identifying a particular relaxation level;

from the plurality of ~~mapping~~ scaling relationships, selecting the ~~mapping~~ scaling relationship that corresponds to the particular relaxation level identified by the received value;

based on a decoder buffer usage, scaling the bit budget by using the selected ~~mapping~~ scaling relationship; and

encoding said digital video picture by using the scaled bit budget,

wherein the receiving of the plurality of ~~mapping~~ scaling relationships, the receiving of the value, the selecting of the ~~mapping~~ scaling relationship, and the scaling of the bit budget are performed by a rate controller.

2-4. (Previously Canceled)

5-8. (Canceled)

9-11. (Previously Canceled)

12-14. (Canceled)

15. (Currently Amended) A method of encoding a sequence of video frames, the method comprising:

allocating an initial value for a bit budget for a current frame in the sequence of video frames;

~~determining an initial value for a scale value based on a percentage of a memory buffer space used, said scale value for scaling the bit budget to prevent an underflow or an overflow of said memory buffer;~~

receiving ~~determining~~ a relaxation control value ~~to relax said scaling of the bit budget, said relaxation control value specifying a particular scaling relationship from a plurality of scaling relationships for scaling the bit budget in relation to a percentage of memory buffer space used, the scaling performed in order to prevent an underflow or an overflow of the memory buffer;~~

determining a scale value for scaling the bit budget based on the percentage of memory buffer space used by using the specified scaling relationship;

determining a final bit budget for the current frame based on said scale value ~~adjusted with the relaxation control value;~~ and

encoding the current video frame using the final bit budget,

wherein the allocating, ~~the determining of the initial value,~~ the determining receiving of the relaxation control value, the determining of the scale value, and the determining of the final bit budget are performed by a rate controller.

16. (Currently Amended) The method of encoding a sequence of video frames as claimed in claim 15, ~~wherein said scale value is set in a range from 0 to 1,~~ wherein said received relaxation control value is [[set]] in a range from 0 to 1, wherein said determined scale value is in a range from 0 to 1.

17-19. (Canceled)

20. (Currently Amended) The method of claim 15, wherein determining the final bit budget for the current frame comprises multiplying the initial bit budget by the ~~adjusted~~ scale value.

21. (Canceled)

22. (Previously Presented) The method of claim 1, wherein a larger relaxation level results in a smaller scaling of the bit budget for the digital video picture.

23. (Previously Presented) The method of claim 1, wherein the bit budget is not scaled when the decoder buffer does not deviate from a target path.

24. (Previously Presented) The method of claim 1, wherein a relaxation level of 0 results in maximal scaling of the bit budget with respect to decoder buffer usage and a relaxation level of 1 results in no scaling of the bit budget regardless of the decoder buffer usage.

25. (Currently Amended) The method of claim 1, wherein the plurality of ~~mapping~~ scaling relationships includes a base ~~mapping~~ scaling relationship when the value identifying the particular relaxation level is 0, wherein the other ~~mapping~~ scaling relationships are derived by using the base ~~mapping~~ scaling relationship and the value identifying the particular relaxation level.

26. (Currently Amended) The method of claim 1, wherein each of the plurality of different ~~mapping~~ scaling relationships maps a plurality of buffer anxiety levels quantifying buffer underflow or overflow to a plurality of scaling values for scaling the bit budget.

27. (Currently Amended) The method of claim 1, wherein a first value identifying a first relaxation level results in selection of a first ~~mapping~~ scaling relationship between the decoder buffer usage and the scaling of the bit budget and a second value identifying a second relaxation level results in selection of a second ~~mapping~~ scaling relationship between the decoder buffer usage and the scaling of the bit budget, wherein the first value results in a greater effect on the scaling of the bit budget with respect to the buffer usage as compared to the second value, wherein the first level corresponds to a greater concern regarding optimal use of the decoder buffer.